

UNIT TERMINAL OBJECTIVE

1-10 At the completion of this unit, the paramedic student will be able to integrate the physiological, psychological, and sociological changes throughout human development with assessment and communication strategies for patients of all ages.

COGNITIVE OBJECTIVES

At the completion of this unit, the paramedic student will be able to:

- 1-10.1 Compare the physiological and psychosocial characteristics of an infant with those of an early adult. (C-3)
- 1-10.2 Compare the physiological and psychosocial characteristics of a toddler with those of an early adult. (C-3)
- 1-10.3 Compare the physiological and psychosocial characteristics of a pre-school child with those of an early adult. (C-3)
- 1-10.4 Compare the physiological and psychosocial characteristics of a school-aged child with those of an early adult. (C-3)
- 1-10.5 Compare the physiological and psychosocial characteristics of an adolescent with those of an early adult. (C-3)
- 1-10.6 Summarize the physiological and psychosocial characteristics of an early adult. (C-3)
- 1-10.7 Compare the physiological and psychosocial characteristics of a middle aged adult with those of an early adult. (C-3)
- 1-10.8 Compare the physiological and psychosocial characteristics of a person in late adulthood with those of an early adult. (C-3)

AFFECTIVE OBJECTIVES

1-10.9 Value the uniqueness of infants, toddlers, pre-school, school aged, adolescent, early adulthood, middle aged, and late adulthood physiological and psychosocial characteristics. (A-3)

PSYCHOMOTOR OBJECTIVES

None identified for this unit.

DECLARATIVE

- I. Infancy (birth to 1 year)
 - A. Physiological
 - 1. Vital signs
 - a) Heart rate
 - (1) 100 to 160 beats per minute during first 30 minutes
 - (2) Settling around 120 beats per minute
 - b) Respiratory
 - (1) Rate
 - (a) Initially 40 - 60
 - (b) Dropping to 30 - 40 after first few minutes of life
 - (c) Slowing to 20 - 30 by one year
 - (2) Tidal volume
 - (a) 6 - 8 ml/ kg initially
 - (b) Increasing to 10 - 15 ml/ kg by 1 year
 - c) Blood pressure
 - (1) Average systolic blood pressure increases from 70 at birth to 90 at 1 year
 - d) Temperature ranges
 - (1) 98 to 100 degrees Fahrenheit is the thermoneutral range
 - 2. Weight
 - a) Normally 3.0-3.5 kg. at birth
 - b) Normally drops 5-10% in the first week of life due to excretion of extracellular fluid
 - c) Exceed birth weight by second week
 - d) Grows at approximately 30 gm/day during the first month
 - e) Should double weight by 4-6 months
 - f) Should triple weight at 9-12 months
 - g) Infants head equal to 25% of the total body weight
 - 3. Cardiovascular system
 - a) Circulatory changes soon after birth
 - (1) Closing of the ductus arteriosus
 - (2) Closing of the ductus venosus
 - (3) Closing of the foramen ovale
 - (4) Immediate increase in systemic vascular resistance
 - (5) Decrease in pulmonary vascular resistance
 - b) Left ventricle strengthens throughout first year
 - 4. Pulmonary system
 - a) Airways, shorter, narrower, less stable, more easily obstructed
 - b) Infants primarily nose breathers until 4 weeks
 - c) Lung tissue is fragile and prone to barotrauma
 - d) Fewer alveoli with decreased collateral ventilation
 - e) Accessory muscles immature, susceptible to early fatigue
 - f) Chest wall less rigid
 - g) Ribs positioned horizontally, causing diaphragmatic breathing
 - h) Higher metabolic and oxygen consumption rates than adults
 - i) Rapid respiratory rates lead to rapid heat, and fluid loss
 - 5. Renal system
 - a) Kidneys unable to concentrate urine
 - b) Specific gravity rarely exceeds 1.020

6. Immune system
 - a) Passive immunity retained through the first 6 months of life
 - b) Based on maternal antibodies
7. Nervous system
 - a) Movements
 - (1) Strong, coordinated suck and gag
 - (2) Well flexed extremities
 - (3) Extremities move equally when infant is stimulated
 - b) Reflexes
 - (1) Moro reflex
 - (2) Palmar grasp
 - (3) Sucking reflex
 - (4) Rooting reflex
 - c) Fontanelles
 - (1) Posterior fontanelle closes at 3 months
 - (2) Anterior fontanelle closes between 9 to 18 months
 - (3) Fontanelles may provide an indirect estimate of hydration
 - d) Sleep
 - (1) Initially sleeps 16-18 hours per day with sleep and wakefulness evenly distributed over 24 hours.
 - (2) Gradually decreases to 14-16 hours per day with 9-10 hour concentration at night
 - (3) Sleeps through the night at 2-4 months
 - (4) Normal infant is easily arousable
8. Musculoskeletal system
 - a) Bone growth
 - (1) Epiphyseal plate - length
 - (2) Growth in thickness occurs by deposition of new bone on existing bone
 - (3) Is influenced by
 - (a) Growth hormone
 - (b) Genetic factors
 - (c) Thyroid hormone
 - (d) General health
 - b) Muscle weight is about 25% in infants
9. Dental system
 - a) Teeth begin to erupt at 5-7 months
10. Growth and development in infants
 - a) Rapid changes over first year
 - (1) 2 months
 - (a) Tracks objects with eyes
 - (b) Recognizes familiar faces
 - (2) 3 months
 - (a) Moves objects to mouth with hands
 - (b) Displays primary emotions with distinct facial expressions
 - (3) 4 months
 - (a) Drools without swallowing
 - (b) Reaches out to people
 - (4) 5 months
 - (a) Sleeps throughout night without food
 - (b) Discriminates between family and strangers

- (5) 6 months
 - (a) Sits upright in a highchair
 - (b) Makes one syllable sounds; e.g., ma, mu, da, di
 - (6) 7 months
 - (a) Fear of strangers
 - (b) Quickly changes from crying to laughing
 - (7) 8 months
 - (a) Responds to "no"
 - (b) Sits alone
 - (c) Plays "peek-a-boo"
 - (8) 9 months
 - (a) Respond to adult anger
 - (b) Pulls self to standing position
 - (c) Explores objects by mouthing, sucking, chewing, and biting
 - (9) 10 months
 - (a) Pays attention to own name
 - (b) Crawls well
 - (10) 11 months
 - (a) Attempts to walk without assistance
 - (b) Shows frustration to restrictions
 - (11) 12 months
 - (a) Walks with help
 - (b) Knows own name
- B. Psychosocial development
- 1. Family processes - reciprocal socialization
 - a) Scaffolding
 - b) Attachment
 - c) Trust versus mistrust
 - d) Secure attachment
 - 2. Temperament - infants may be
 - a) Easy child
 - b) Difficult child
 - c) Slow to warm-up child
 - 3. Crying
 - a) Basic cry
 - b) Anger cry
 - c) Pain cry
 - 4. Trust - based on consistent parental care
 - 5. Situational crisis - parental separation reactions
 - a) Protest
 - b) Despair
 - c) Withdrawal
 - 6. Growth charts
 - a) Good for comparing physical development to norm
- II. Toddler (12 to 36 months) and pre-school age (3 to 5 years)
- A. Physiological
- 1. Vital signs
 - a) Heart rate
 - (1) Toddlers - 80 to 130 beats per minute

- (2) Preschoolers - 80 to 120 beats per minute
- b) Respiratory rate
 - (1) Toddlers - 20 to 30
 - (2) Preschoolers- 20 to 30
- c) Systolic blood pressure
 - (1) Toddlers - 70 to 100 mmHg
 - (2) Preschools - 80 to 110 mmHg
- d) Temperature - 96.8 to 99.6 F degrees Fahrenheit
- 2. Weight
 - a) Rate of gain slows dramatically
 - b) Average child gains 2 kg per year
- 3. Cardiovascular system
 - a) Capillary beds better developed to assist in thermoregulation
 - b) Hemoglobin levels approach normal adult levels
- 4. Pulmonary system
 - a) Terminal airways continue to branch
 - b) Alveoli increase in number
- 5. Renal system
 - a) Kidneys are well developed in toddler years
 - b) Specific gravity and other urine findings similar to adults
- 6. Immune system
 - a) Passive immunity lost, more susceptible to minor respiratory and gastrointestinal infections
 - b) Develops immunity to common pathogens as exposure occurs
- 7. Nervous system
 - a) Brain 90% of adult weight
 - b) Myelination increases cognitive development
 - c) Development allows effortless walking and other basic motor skills
 - d) Fine motor skills developing
- 8. Musculoskeletal system
 - a) Muscle mass increases
 - b) Bone density increases
- 9. Dental system
 - a) All primary teeth have erupted by 36 months
- 10. Elimination patterns
 - a) Toilet training
 - (1) Physiologically capable by 12 to 15 months
 - (2) Psychologically ready between 18 and 30 months
 - (3) Average age for completion - 28 months
- 11. Sensory
 - a) Visual acuity - 20/ 30 during the toddler years
 - b) Hearing - essential maturity at 3 to 4 years
- B. Psychosocial
 - 1. Cognitive
 - a) Basics of language mastered by approximately 36 months, with continued refinement throughout childhood
 - b) Understands cause and effect between 18-24 months
 - c) Develops separation anxiety - approximately 18 months
 - d) Develops magical thinking - between 24 and 36 months
 - 2. Play

- a) Exploratory behavior accelerates
 - b) Able to play simple games and follow basic rules
 - c) Begin to display competitiveness
 - d) Observation of play may uncover frustrations otherwise unexpressed
3. Sibling relationships
- a) Sibling rivalry
 - b) First born children
 - (1) Usually maintain special relationship with parents
 - (2) Expected to exercise self-control and show responsibility in interacting with younger siblings
4. Peer group functions
- a) Children about the same age and maturity levels
 - b) Provide a source of information about the outside world and other families
 - c) Become more important to the child throughout childhood
5. Parenting styles and its effect on children
- a) [Authoritarian parenting](#)
 - b) [Authoritative parenting](#)
 - c) [Permissive-indifferent parenting](#)
 - d) [Permissive-indulgent parenting](#)
6. Divorce effects on child development
- a) Mediated by
 - (1) Age
 - (2) Cognitive and social competencies
 - (3) Amount of dependency on parents
 - (4) Type of day care
 - (5) Parents' ability to respond to the child's needs
7. Television
- a) May be a cause in aggression at this age
 - b) Careful screening of television exposure may be effective
8. Modeling
- a) Children begin to recognize the differences of sex
 - b) Begin to model themselves based on sex
- III. School age children (6 to 12 years)
- A. Physiological
- 1. Vital signs
 - a) Heart rate - 70 to 110 beats per minute
 - b) Respiratory rate - 20 to 30
 - c) Systolic blood pressure - 80 to 120 mmHg
 - d) Temperature - 98.6 degrees Fahrenheit
 - 2. Growth rate
 - a) Average child gains 3 kg per year and 6 cm per year
 - 3. Bodily functions
 - a) Most reach adult levels during this period
 - b) Lymph tissues proportionately larger than adult
 - c) Brain function increases in both hemispheres
 - d) Loss of primary teeth and replacement with permanent teeth begins
- B. Psychosocial
- 1. Families
 - a) Children allowed more self regulation

- b) Parents still provide general supervision
- c) Parents spend less time with children in this age group
- 2. Develop self-concept
 - a) More interaction with adults and children
 - (1) Begin comparing themselves with others
 - (2) Develop self-esteem
 - (a) Tends to be higher during early years of school than later years
 - (b) Often based on external characteristics
 - (c) Effected by peer popularity, rejection, emotional support, and neglect
 - (d) Negative self-esteem can be damaging to further development
- 3. Moral development
 - a) Pre-conventional reasoning
 - (1) Punishment and obedience
 - (2) Individualism and purpose
 - b) Conventional reasoning
 - (1) Interpersonal norms
 - (2) Social system morality
 - c) Post-conventional reasoning
 - (1) Community rights versus individual rights
 - (2) Universal ethical principles
 - d) Individuals move through development throughout school age and young adulthood at different paces

IV. Adolescence - (13 to 18 years)

A. Physiological

- 1. Vital signs
 - a) Heart rate - 55 to 105 beats per minute
 - b) Respiratory rate - 12 to 20 breaths per minute
 - c) Blood pressure - 100 to 120
 - d) Temperature- 98.6 degrees Fahrenheit
- 2. Growth rate
 - a) Most experience a rapid 2-3 year growth spurt
 - (1) Begins distally with enlargement of feet and hands
 - (2) Enlargement of the arms and legs follows
 - (3) Chest and trunk enlarge in final stage
 - b) Girls are mostly done growing by age 16, boys are mostly done growing by age 18
 - c) Secondary sexual development occurs
 - (1) Noticeable development of the external sexual organs
 - (2) Pubic and axillary hair develops
 - (3) Vocal quality changes occur (mostly in males)
 - (4) Menstruation initiates (in females)
 - d) Endocrine changes
 - (1) Female
 - (a) FSH and LH release
 - (b) Gonadotropin promote estrogen and progesterone production
 - (c) Other biologic changes
 - (2) Male
 - (a) Gonadotropin promote testosterone production

- e) Reproductive maturity
 - f) Muscle mass and bone growth nearly complete
 - g) Body fat decreases early in adolescence, and begins to increase later
(1) [Females require 18-20% body fat percentage for menarche to occur](#)
 - h) Blood chemistry nearly equal to adult levels
 - i) Skin toughens through sebaceous gland activity
- B. Psychosocial
- 1. Family
 - a) Conflicts arise
 - (1) Adolescents strive for autonomy
 - (2) Biological changes associated with puberty
 - (3) Increased idealism
 - (4) Independence and identity changes
 - 2. Develop identity
 - a) Self-consciousness increases
 - b) Peer pressure increases
 - c) Interest in the opposite sex increases
 - d) Want to be treated like adults
 - e) Progress through various stages based on how they handle crisis, etc.
 - f) Anti-social behavior peaks around eighth or ninth grade
 - g) Minority adolescents tend to have more identity crisis than non-minority
 - h) Body image of great concern
 - (1) Continual comparison amongst peers
 - (2) Eating disorders are common
 - i) Self-destructive behaviors begin
 - (1) Tobacco
 - (2) Alcohol
 - (3) Illicit drugs
 - j) Depression and suicide more common than any other age group
 - 3. [Ethical development](#)
 - a) [Develop capability for logical, analytical, and abstract thinking](#)
 - b) [Develop a personal code of ethics](#)
- V. Early adulthood (20 to 40 years)
- A. Physiological
 - 1. Vital signs
 - a) Heart rate - average 70 beats per minute
 - b) Respiratory rate - average 16 to 20
 - c) Blood pressure - average 120/ 80 mmHg
 - d) Temperature - 98.6 degrees Fahrenheit
 - 2. Peak physical conditioning between 19 and 26 years of age
 - 3. Adults develop lifelong habits and routines during this time
 - 4. All body systems at optimal performance
 - 5. Accidents are a leading cause of death in this age group
 - B. Psychosocial
 - 1. Experience highest levels of job stress during this time
 - 2. Love develops
 - a) Romantic love
 - b) Affectionate love
 - 3. Childbirth most common in this age group

- 4. a) New families provide new challenges and stress
 - 4. This period is less associated with psychological problems related to well-being
- VI. Middle adulthood (41 to 60 years)
- A. Physiological
 - 1. Vital signs
 - a) Heart rate - average 70 beats per minute
 - b) Respiratory rate - average 16 - 20
 - c) Blood pressure - average 120/ 80 mmHg
 - d) Temperature - 98.6 degrees Fahrenheit
 - 2. Body still functioning at high level with varying degrees of degradation
 - 3. Vision changes
 - 4. Hearing less effective
 - 5. Cardiovascular health becomes a concern
 - a) Cardiac output decreases throughout this period
 - b) Cholesterol levels increased
 - 6. Cancer strikes in this age group often
 - 7. Weight control more difficult
 - 8. Menopause in women in late 40s early 50s
 - B. Psychosocial
 - 1. Adults in this group more concerned with “social clock”
 - a) Task oriented
 - b) Pressed for time to accomplish lifelong goals
 - 2. Approach problems more as challenges than threats
 - 3. Empty-nest syndrome
 - 4. Often burdened by financial commitments for elderly parents as well as young adult children
- VII. Late adulthood (61 years and older)
- A. Physiological
 - 1. Vital signs
 - a) Heart rate - depends on patient's physical and health status
 - b) Respiratory rate - depends on patient's physical and health status
 - c) Blood pressure - depends on patient's physical and health status
 - d) Temperature - 98.6 degrees Fahrenheit
 - 2. Life span - maximum approximately 120 years.
 - 3. Life expectancy - average length based on year of birth
 - 4. Cardiovascular function changes
 - a) Blood vessels
 - (1) Thickening
 - (2) Increased peripheral vascular resistance
 - (3) Reduced blood flow to organs
 - (4) Decreased baroreceptor sensitivity
 - (5) By 80 years of age, there is approximately 50% decrease in vessel elasticity
 - b) Heart
 - (1) Increased workload causes
 - (a) Cardiomegaly
 - (b) Mitral and aortic valve changes
 - (c) Decreased myocardial elasticity

- (2) Myocardium is less able to respond to exercise
- (3) Fibrous tissues in SA node
- (4) Pacemaker cells diminish resulting in arrhythmia
- (5) Tachycardia not well tolerated
- c) Blood cells
 - (1) Functional blood volume decreased
 - (2) Decrease in platelet count
 - (3) RBCs diminished
 - (4) Poor iron levels
- 5. Respiratory system
 - a) Changes in mouth, nose, and lungs
 - b) Metabolic changes lead to decreased lung function
 - c) Muscular changes
 - (a) Diaphragm elasticity diminished
 - (b) Chest wall weakens
 - d) Diffusion through alveoli diminished
 - (a) Life long exposure to pollutants, etc.
 - e) Lung capacity diminished
 - f) Coughing ineffective
 - (1) Weakened chest wall
 - (2) Weakened bone structure
- 6. Endocrine system changes
 - a) Decreased glucose metabolism
 - b) Decreased insulin production
 - c) Thyroid shows some diminished T3 production
 - d) Cortisol diminished by 25 %
 - e) Pituitary gland 20% less effective
 - f) Reproductive organs atrophy in women
- 7. Gastrointestinal system
 - a) Mouth, teeth, and saliva changes
 - b) Peristalsis decreased
 - c) Esophageal sphincter less effective
 - d) GI secretions decreased
 - e) Vitamin and mineral deficiencies
 - f) Internal intestinal sphincters lose tone
- 8. Renal system
 - a) 50% nephrons lost
 - b) Abnormal glomeruli more common
 - c) Decreased elimination
- 9. Sensory changes
 - a) Loss of taste buds
 - b) Olfactory diminished
 - c) Diminished pain perception
 - d) Diminished kinesthetic sense
 - e) Visual acuity diminished
 - f) Reaction time diminished
 - g) Presbycusis problems with hearing
- 10. Nervous system
 - a) Neuron loss
 - b) Neurotransmitters diminish

- B. Psychosocial
 - c) Sleep - wake cycle disrupted
 - 1. Terminal drop hypothesis
 - a) Death preceded by a decrease in cognitive functioning over a five year period prior to death
 - 2. Wisdom attributed to age in some cultures
 - 3. 95% of older adults live in communities
 - 4. Challenges
 - a) Self worth
 - b) Declining well being
 - c) Financial burdens
 - d) Death or dying of companions